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**REMARKS**

Applicants appreciate the Examiner's thorough examination of the subject application and request reconsideration of the subject application based on the foregoing amendments and the following remarks.

Applicants also acknowledge with thanks the telephone interview with the Examiner and his clarifications regarding the rejections.

Claims 1-15, 18-34 and 37-44 are pending in the subject application.

Claims 1-15, 18-34 and 37-40 are acknowledged as being allowable by the Examiner.

Claims 16, 17, 35 and 36 were previously canceled.

Claims 41-44 stand rejected under 35 U.S.C. §101 and/or 35 U.S.C. §112, first paragraph.

Claims 41 and 43 were amended to more clearly indicate that the program is for execution on a computer. Claims 42 and 43 were amended to more distinctly claim the present invention.

**35 U.S.C. §101 REJECTIONS**

Claims 41 and 43 stand rejected under 35 U.S.C. §101 as provided on the pages 3-4 of the above-referenced Office Action. In particular, it asserted that these claims are directed to computer programs per se and thus are not directed to statutory subject matter. Applicants respectfully traverse.

Before turning to the claim language reference is first made to the guidelines provided in the MPEP as to patentable subject matter for computer related inventions generally provided in MPEP - 2106. As provided in the MPEP (see MPEP-2106 IV.A):

Computer programs are often recited as part of a claim. Office personnel should determine whether the computer program is being claimed as part of an otherwise statutory manufacture or machine. In such a case, the claim remains statutory irrespective of the fact that a computer program is included in the claim. The same result occurs when a computer program is used in a

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computerized process where the computer executes the instructions set forth in the computer program. Only when the claimed invention taken as a whole is directed to a mere program listing, i.e., to only its description or expression, is it descriptive material *per se* and hence nonstatutory.

Since a computer program is merely a set of instructions capable of being executed by a computer, the computer program itself is not a process and Office personnel should treat a claim for a computer program, without the computer-readable medium needed to realize the computer program's functionality, as nonstatutory functional descriptive material. When a computer program is claimed in a process where the computer is executing the computer program's instructions, Office personnel should treat the claim as a process claim. See paragraph IV.B.2(b), below. When a computer program is recited in conjunction with a physical structure, such as a computer memory, Office personnel should treat the claim as a product claim. See paragraph IV.B.2(a), below.

The MPEP also provides (see MPEP-2106 IV.B.2.(a)) that if a claim is directed to a machine and the physical structure of the machine is defined in terms of its hardware or hardware and software combination, it defines a statutory product. As more particular provided in the MPEP:

If a claim defines a useful machine or manufacture by identifying the physical structure of the machine or manufacture in terms of its hardware or hardware and software combination, it defines a statutory product. See, e.g., *Lowry*, 32 F.3d at 1583, 32 USPQ2d at 1034-35; *Warmerdam*, 33 F.3d at 1361-62, 31 USPQ2d at 1760.

Thus, it is clear that the Patent Laws as well as the MPEP do not require that the only way in which a computer program can be claimed and also be considered statutory subject matter is by claiming the program embodied in a computer-readable medium/media. This is not just the case. In particular this is not the case where the computer program is being claimed along with the physical structure of a machine or device.

In regards to the language of the claims, claim 41 claims a waveform equalization program *for execution on a computer of a waveform equalizing device so as to control operation of the waveform equalizing device*, and claim 43 claims a signal quality evaluation program *for execution on a computer of a signal quality evaluation device for controlling operation of said*

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In regards to the language of the claims, claim 41 claims a waveform equalization program *for execution on a computer of a waveform equalizing device so as to control operation of the waveform equalizing device*, and claim 43 claims a signal quality evaluation program *for execution on a computer of a signal quality evaluation device for controlling operation of said*

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*signal quality evaluation device.* In view of the foregoing it is clear that claims 41 and 43 are directed to programs that are executed on a computer of a given device and the purpose of the program is to control operation of the given device. In other words, the program is limited in application to the given device that is listed in the claim.

While Applicant's believe that the "for execution on a computer language" establishes that the program is being claimed along with the device it is being used with and thus is statutory subject matter, Applicants' have in the interests of advancing prosecution amended claims 41 and 43 to claim the program in combination with the computer which Applicants believe clearly establishes that the device of either claims 41 and 43 are being claimed or defined in terms of its program and hardware (*i.e.*, computer).

In view of the foregoing remarks, it is respectfully submitted that claim 41 or 43 are not directed solely to a computer program. Thus, claims 41 and 43 are each directed to statutory subject matter and therefore satisfy the requirements of 35 USC §101.

35 U.S.C. 112, FIRST PARAGRAPH REJECTIONS

Claims 41-44 stand rejected under 35 U.S.C. §112, first paragraph for a number of reasons as set forth on pages 2-3 of the Office Action. Applicants respectfully traverse.

The grounds for the rejection all appear to be based on a common factor, namely that the specification does not specifically include a flow chart or method steps that can be readily corresponded to program instructions. Applicants respectfully submit that the subject application does provide an enabling disclosure, that the subject application does describe the best mode and also satisfies the written description requirement.

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As provided on pages 60-61 of the subject application, as well as elsewhere in the subject, hardware functions being described in the subject application can be carried out in hardware or software. In particular the subject application provides (see page 60, line 15 page 61 line 17):

Each block in the wave form equalizing devices of embodiments 1,2 may be constructed of either hardware or software. A computer-based software implementation is be presented next.

The waveform equalizing device (the optical disc reproducing device 20, 21 in Fig. 1, 11 less the optical disc 1, the optical pickup 2, and the A/D converter 3 or the communication data receiving device 30 in Fig. 12 less the receiver 31 and the A/D converter 3) may be constructed of a computer including a CPU (central processing unit) executing instructions in a waveform equalization program implementing the functions of the device, a ROM (read only memory) storing the program, a RAM (random access memory) into which the program is loaded, and a memory storing the program and various data and other storage device (storage medium) among others. In other words, the objectives of the present invention is achievable by loading into a computer a computer-readable storage medium storing program codes (an execution program, intermediate code program, or source program) of a waveform equalization program which is a software implementation of the aforementioned functions and causing the computer to read and execute the program codes recorded on the storage medium. In this case, the program codes per se as read out from the storage medium realizes the aforementioned functions, and the storage medium storing the program codes constitutes the present invention.

As can be seen from the foregoing excerpt, the computer program being executed on the computer of the device listed in claims 41 and 43 as well as being stored on the storage mediums of claims 42 and 44, is a software implementation of the functions that are described earlier in the subject application in connection with the hardware implementation. In addition, it should be

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remembered that claims 41-44 were written and introduce to replace originally filed claims 16-17 and 35-36. In this regard, claim 16 had provided that the claimed computer program was causing a computer program to carry out the functions of claim 1 and claim 17 had provided that the program of claim 16, causing a computer program to carry out the functions of claim 1, was recorded on a computer-readable storage medium. Similarly, claim 35 had provided that the claimed computer program was causing a computer program to carry out the functions of claim 29 and claim 36 had provided that the program of claim 35, causing a computer program to carry out the functions of claim 29, was recorded on a computer-readable storage medium. Claims 16 and 17 and 35-36 were originally filed claims and thus, also must be considered as being part of the originally filed disclosure for supporting the claims of the subject application.

In sum, the foregoing excerpts from the subject application including originally filed claims 16-17 and 35-36 clearly indicate that the functions being described in connection with the hardware implementation also can be carried out as a software implementation. The originally filed claims on which claims 41 and 43 are based, also provide that the program for operating the identified device in the claims causes the computer of the device to function as each of the means of claim 1 or 29, respectively. The originally filed claims on which claims 42 and 44 are based, also provide that it was this program for operating the identified device in the claims that causes the computer of the device to function as each of the means of claim 1 or 29, respectively, which was being recorded on a computer-readable storage medium.

As also indicated above, the optical disc reproducing device 20,21 in Fig. 1 or 11 less the optical disc 1, the optical pickup 2, and the A/D converter 3 can be implemented as a software implementation. Referring to Fig. 1 and the discussion on page 24 of the subject application, it can be seen that the functionalities in Fig. 1 that can be implemented as software include *inter alia* the FIR filter 4, Viterbi decoder 5, path memory length delay circuits 6, and specific patterns detector circuit 7, and tap coefficients update circuit 10.

The FIR filter 4, the Viterbi decoder 5, specific patterns detector circuit 7, and path memory length delay circuits 6 are first described on pages 25-27 of the subject application. The

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decoding performed by Viterbi decoder 5 also is further described on pages 27- 31 with reference also to Figs. 2-3 of the subject application. Further the subject application describes a reproducing operation by the optical reproducing device shown in Fig. 1 on pages 31-57 and with reference also to Figs. 6-10 of the subject application, which further describe the functionalities of the optical reproducing device that can be implemented in software.

Thus, it is respectfully submitted that anyone skilled in the art of computer programming would be able to write computer code, including program code segments, instructions and criteria to implement the teachings and disclosure directed to the hardware implementation of the waveform equalizing device and its functionalities as is fully disclosed and taught in the subject application so as to thereby yield a software implementation of the described hardware functions. There is no requirement or need to also cast the hardware described functions and attributes and the manner by which such hardware carries out these functions specifically in the form of a flow chart in the subject application so that one skilled in the programming arts could understand and practice the claimed software implementation. Even if those skilled in the programming arts might require assistance from those knowledgeable in the hardware arts to develop an understanding of the hardware, does not mean that the described hardware functionalities cannot be implemented as software for execution on a computer by one skilled in the software arts. In addition, Applicants also respectfully submit that one skilled in the programming arts can create computer code, including code segments, instructions and criteria, to implement the mathematical expressions embodied in the described hardware implementation. In sum, it is well within those skilled in the arts for the functions and attributes of the hardware implementation as described in the subject application (*i.e.*, for those functionalities that can be implemented as software per the subject application) to be implemented as a software implementation such that the so converted functionalities of the hardware implementation can be carried out by such a software implementation.

As also indicated above, the optical disc reproducing device 21 in Fig. 11 less the optical disc 1, the optical pickup 2, and the A/D converter 3 can be implemented as a software

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implementation. It is respectfully submitted that the foregoing remarks regarding optical disc reproducing device 20 of Fig. 1 also applies to Fig. 11.

As also indicated above, the communication data receiving device 30 in Fig. 12 less the receiver 31 and the A/D converter 3 may be implemented as software. As provided on page 24 of the subject application:

An example is shown in Fig. 12 where the arrangement of a communication data receiving device (communications device) 30, an equivalent to the optical disc reproducing device 20 of embodiment 1. The communication data receiving device 30 here has an arrangement corresponding to embodiment 1; alternatively, it may have an arrangement corresponding to embodiment 2.

The communication data receiving device 30 includes a receiver (receiving means) 31 receiving a communication waveform transmitted through a communication path, wired or wireless (Fig. 12 shows the latter), replacing the optical pickup 2 for the case of the optical disc reproducing device 20. The communication data receiving device 30 is otherwise arranged identically to the optical disc reproducing device 20; detailed description is omitted here.

In view of the foregoing excerpt it can be seen that the foregoing remarks regarding Fig. 1 also would apply to Fig. 12.

Accordingly, claims 41-44 satisfy the requirements of 35 U.S.C. §112, first paragraph and, therefore, these claims are allowable and the specification is considered acceptable.

#### OTHER MATTERS

Applicants filed a Supplemental Information Disclosure Statement/ Search Report Information Disclosure Statement dated July 24, 2006 in the USPTO, which IDS post-dates the above-referenced Final Office Action. Accordingly, Applicants respectfully request that the

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Examiner reflect their consideration of this IDS in the next official communication from the USPTO. Applicants also respectfully request the Examiner to call the undersigned collect and at the below number in the event that this IDS has not been received by the Examiner and thus needs to be again submitted by Applicants for the Examiner's consideration.

It is respectfully submitted that the subject application is in a condition for allowance. Early and favorable action is requested.

Applicants believe that additional fees are not required for consideration of the within Response. However, if for any reason a fee is required, a fee paid is inadequate or credit is owed for any excess fee paid, the Commissioner is hereby authorized and requested to charge Deposit Account No. 04-1105.

Respectfully submitted,  
Edwards & Angell, LLP

Date: October 23, 2006

By:

  
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